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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 30111-2025

Replacing GB/T 30111-2013

General specification for star sensor

星敏感器通用规范

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document replaces GB/T 30111-2013 "General Specification for Star Sensors". Compared with GB/T 30111-2013, in addition to structural adjustments and In addition to editorial changes, the main technical changes are as follows.

a) The terms and definitions of point source transmittance and star image signal-to-noise ratio (see 3.2 and 3.3 of the 2013 edition) were deleted, and the terms and definitions of single-star angle measurement accuracy were added.

The terms and conditions of the measurement accuracy, attitude measurement accuracy, optical axis thermal stability, sunlight suppression angle, ground-air light suppression angle, and all-day autonomous recognition probability Definitions (see 3.5, 3.6, 3.7, 3.8, 3.9 and 3.10);

b) The expression "detailed specification" has been changed and replaced by "special technical documents" (see 4.1, 4.4, 4.7, 4.8, 4.9, 4.13, 5.1.2, 5.5.2, 5.5.5, 5.5.6, 5.5.7, 5.5.8, 5.5.11, 6.1, 6.2, 2013 edition 4.1, 4.13, 5.1.2, 5.5.1.8.1.2, 5.5.8, 6.1, 6.2);

c) Changed the working spectral range requirements (see 4.3.4, 4.3.4 of the 2013 edition);

d) The requirements for diffuse spot size and energy distribution have been changed (see 4.3.5, 4.3.5 of the 2013 edition);

e) Changed the solar suppression angle requirements (see 4.3.6, 4.3.6 of the 2013 edition);

f) Deleted the signal-to-noise ratio, distortion, quantization level, controllable gain, and integration time of the star map (see 4.3.7, 4.3.9, 4.3.13, 4.3.14, 4.3.15, 5.5.1.7, 5.5.1.9, 5.5.1.13, 5.5.1.14, 5.5.1.15);

g) Added technical requirements and test methods related to the ground-air light suppression angle (see 4.3.7 and 5.5.1.7);

h) The range of the faintest magnitude has been changed (see 4.3.8, 4.3.8.1 of the 2013 edition);

i) Changed the requirements for the probability of autonomous identification throughout the day and deleted the formula for estimating the probability and number of satellite identification (see 4.3.9, 2013 edition). 4.3.8.2);

j) The single-satellite angle measurement accuracy requirements have been modified (see 4.3.10, 4.3.10 of the 2013 edition);

k) The expression and measurement regulations of attitude measurement accuracy have

been changed (see 4.3.11, 4.3.11 of the 2013 edition);

l) Added technical requirements and test methods related to thermal stability of optical axis (see 4.3.12, 5.5.1.12);

m) The dynamic performance requirements have been changed (see 4.3.13, 4.3.12 of the 2013 edition);

n) The insulation resistance requirements have been changed (see 4.3.17 and 4.3.19 of the 2013 edition);

o) The technical requirements and inspection methods of the interface have been changed (see 4.4, 5.5.2, 4.4, 5.5.2 of the 2013 edition);

p) Added color requirements for electrostatic marking, electrical connector protection covers, and accessories (see 4.5);

q) The technical requirements and test methods for materials and components, screening, aging, environmental adaptability, and electromagnetic compatibility have been changed (see 4.7, 4.8, 4.9, 4.10, 4.11, 5.5.5, 5.5.6, 5.5.7, 5.5.8, 5.5.9, 2013 version of 4.7, 4.8, 4.9, 4.10, 4.11, 5.5.5, 5.5.6, 5.5.7, 5.5.8, 5.5.9);

r) The technical requirements for environmental adaptability have been changed (see 4.10, 4.10 of the 2013 edition);

s) The design life and reliability requirements have been changed (see 4.12, 4.12 of the 2013 edition);

t) The manufacturing quality requirements have been changed (see 4.13, 4.13 of the 2013 edition);

u) The qualification judgment rules have been changed (see 5.4.1, 5.4.1 of the 2013 edition);

v) The working spectrum range test method has been changed (see 5.5.1.4, 5.5.1.4 of the 2013 edition);

w) Changed the sunlight suppression angle, star detection sensitivity, all-day autonomous recognition probability, single star angle measurement accuracy, attitude measurement accuracy, dynamic Verification methods for dynamic performance, initial capture time, and data update rate (see 5.5.1.6, 5.5.1.8, 5.5.1.9, 5.5.1.10, 5.5.1.11, 5.5.1.13, 5.5.1.14, 5.5.1.15, 5.5.1.6, 5.5.1.8, 5.5.1.9, 5.5.1.10, 5.5.1.11, 5.5.1.12 of the 2013 edition, 5.5.1.16);

x) The inspection methods for design life and reliability have been changed (see 5.5.10, 5.5.10 of the 2013 edition);

y) Added manufacturing quality inspection methods (see 5.5.11);

z) Added attitude measurement error data processing method (see Appendix A).

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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The previous versions of this document and the documents it replaces are as follows.

- First published in 2013 as GB/T 30111-2013;
- This is the first revision.

General Specifications for Star Sensors

1 Scope

This document specifies the general technical requirements, inspection rules, and delivery preparation for star sensors.

This document applies to the design, manufacture, inspection, acceptance, transportation and storage of star sensors.

2 Normative references

GB/T 191

GB/T 4937.18

GB/T 12085.2

GB/T 12085.4

GB/T 12085.22

GB/T 34515